

1 having a size and shape substantially similar to a size and shape of the front surface of the flexible  
2 substrate, such that substantially all of the front surface of the flexible substrate is covered by the  
3 plurality of solid-state light emitting devices, the plurality of solid-state light emitting devices being  
4 electrically connected to the plurality of flexible conductive traces and energized by the electrical  
5 current, emitting light outwardly and away from the front surface of the flexible substrate; and

6 (c) a third flexible layer comprising a transparent flexible envelope that extends  
7 over the plurality of solid-state light emitting devices, providing protection against abrasion, the light  
8 emitted by the plurality of solid-state light emitting devices passing through the transparent flexible  
9 envelope, each flexible layer having sufficient flexibility that when all three flexible layers are  
10 combined to achieve the multi-layered flexible vehicular light source, the resulting multi-layered  
11 flexible vehicular light source is sufficiently flexible to be able to conform to a substantially  
12 non-planar surface.--

#### 13 REMARKS

##### 14 Status of the Claims

15 Claims 1-26 are now pending in the present application. Claims 1, 13, and 23 have been  
16 amended to more clearly define the invention. New Claims 25 and 26 have been added.

##### 17 Claims Objected to for use of "Adapted to" Language

18 The Examiner has objected to Claims 1, 5, 9, 12, 13, 16, 22, and 23 because of the use of  
19 "adapted to" language in each of the above-referenced claims. The Examiner cited In re Hutchison, 69,  
20 and indicated that it has been held that "adapted to" is not a positive limitation, but is instead  
21 understood to mean capable of performing a specific function, and that as such, the term "adapted to" is  
22 given no patentable weight. The Examiner notes that appropriate correction is required.

23 Applicants respectfully submit that even if the term "adapted to" is understood to mean  
24 "capable of" and is afforded no patentable weight, use of the term in the claim is proper and  
25 acceptable, and correction of the claims to eliminate this term is not required. Having reviewed the  
26 cited case, it is noted that in a claim under consideration in this case, the preamble of the claim read:

1 "As an article of manufacture, adapted for use in the fabrication of a metal template or the like  
2 suitable for metal-working operations, a laminated unit comprising a backing element surfaced with  
3 paper having an exposed outer surface to receive the template design, ...." The court in the cited  
4 decision simply indicated that the term "adapted to" could not be relied upon to distinguish over the  
5 art cited in rejecting the claim. The court did not indicate that the term was improper and should not  
6 be included in the claim.

7 Specifically, applicants intend that the Examiner not include elements associated with the  
8 "adapted to" language as elements of the invention for the purpose of analyzing the claim, since  
9 applicants do not intend that a vehicle be considered part of the claimed invention. Instead, the  
10 inclusion of the term and reference to "the external surface of a vehicle" provides context, but does  
11 not make the claim indefinite, so as to justify a rejection under 35 U.S.C. § 112. Accordingly, while  
12 applicants understand that the Examiner will ignore the "adapted to" language in determining  
13 patentability, it is also applicants' belief that no correction is required to eliminate that language from  
14 the claims. Applicants contacted the Examiner by telephone on September 7, 2001, to confirm that  
15 the "adapted to" language did not need to be eliminated from the claims.

16 Claims Rejected Under 35 U.S.C. § 102

17 The Examiner has rejected Claims 1, 2, 4, 8, and 12 under 35 U.S.C. § 102(b) as being  
18 anticipated by Parker (U.S. Patent 5,895,115). The invention disclosed by Parker is generally  
19 directed to both flexible and rigid light emitting panel assemblies having a plurality of light sources  
20 for use in providing lighting on both an interior and an exterior of a vehicle. The reference discloses  
21 that several different types of light sources may be used, including light-emitting diodes, laser diodes,  
22 etc. In addition, the reference teaches that the light sources may be imbedded within a panel, or may  
23 be mounted into a panel so that there is an air space between the light source and the panel.

24 Applicants have amended independent Claim 1 (and independent Claim 13) to further clarify  
25 distinguishing features of the present invention. While Parker discloses a related invention,  
26 applicants' claimed invention and the device disclosed by Parker are fundamentally different.

1 Applicants' claimed invention comprises a three-layer device, including a first layer comprising a  
2 flexible substrate and conductive traces, a layer comprising an array of light sources, and an outer or  
3 upper layer comprising a light transmissive cover. While Parker discloses each of those elements in  
4 different embodiments, a careful review of Parker shows that these elements are combined in a  
5 distinctly different manner, resulting in a distinguishably different structure than that defined by  
6 applicants' claims.

7 To appreciate these differences, it is necessary to first understand how light is emitted by  
8 Parker's device. Note that as disclosed by Parker, the light sources are mounted along an edge of the  
9 flexible substrate and emit light directed *into* the flexible substrate. Accordingly, the flexible  
10 substrate as disclosed by Parker *must* be optically transparent to enable the light emitted by the light  
11 sources disposed along (or in) the edge of the flexible substrate to be transmitted through the flexible  
12 substrate, causing the flexible substrate to be lighted. Light is then directed away from the flexible  
13 substrate by a plurality of light extracting deformities. In one embodiment, a rear surface is coated  
14 with a reflective film to enhance a quantity of light emitted from an upper surface of the flexible  
15 substrate. It is light from the upper surface of the flexible substrate that is viewed by a user of the  
16 device of Parker, not light directly emitted by a plurality of light sources mounted on the surface of a  
17 flexible substrate. Thus, the light emitted by the light sources is emitted orthogonally into the  
18 flexible substrate with respect to the direction of light emitted from the surface of the flexible  
19 substrate that is viewed by a user. The following excerpts from Parker support the above summary of  
20 the device described by Parker:

21 The light that enters the transparent light emitting panel members 8 from the  
22 light transition region(s) 10 may be emitted along the entire length of the panel  
23 members or from one or more light output surface areas along their length as  
desired to produce a desired light output distribution to fit a particular  
application (column 4, lines 44-50).

24 A pattern of light extracting deformities or disruptions 12 (see FIG. 2A) may  
25 be provided on one or both sides 13, 14 of the panel members along the entire  
26 length thereof or at one or more selected areas of the panel members as  
desired. The terms deformities or disruptions are used interchangeably herein

1 to mean any change in the shape or geometry of the panel surface and/or  
2 coating or surface treatment that causes a portion of the light to be emitted. A  
3 pattern of light extracting deformities may include a variable pattern which  
4 breaks up the light rays such that the internal angle of reflection of a portion of  
5 the light rays will be great enough to cause the light rays either to be emitted  
6 out of the panel members through the side or sides on which the light  
7 extraction deformities are provided or reflected back through the panel  
8 members and emitted out the other side (column 5, lines 23-38).

9 Varying the percentages and/or size of deformities in different surface areas of the  
10 panels is necessary in order to provide a uniform light output distribution. For  
11 example, the amount of light traveling through the panels will ordinarily be greater  
12 in areas closer to the light source than in other areas further removed from the  
13 light source. A pattern of light extracting deformities may be used to adjust for the  
14 light variances within the panel members, for example, by providing a denser  
15 concentration of light extracting deformities with increased distance from the light  
16 source thereby resulting in a more uniform light output distribution from the light  
17 emitting panels (column 5, line 65 to column 6, line 9).

18 A back reflector or reflective coating (including trans reflectors) 15 (see FIG. 2)  
19 may be applied to a bottom side of the panel members using a suitable adhesive  
20 or other method in order to improve light output efficiency of the panel  
21 assemblies by reflecting the light emitted from that side back through the panel  
22 members for emission through the opposite side. If adhesive is used to adhere  
23 the back reflector to the panel members, the adhesive is desirably applied only  
24 along the side edges of the panel members so that there is a slight air gap  
25 between the back reflector and panel members except where there is adhesive,  
26 since the adhesive changes the internal critical angle of the light in a less  
controllable manner than the air gap between the panel surface and back  
reflector (column 7, lines 1-14).

18 In contrast, applicants' invention (as recited in independent Claims 1 and 13) does not direct  
19 light *into* the flexible substrate. Instead, light sources are arrayed on the flexible substrate such that  
20 light emitted from the light sources is directed outwardly and away from the flexible substrate.  
21 Accordingly, the flexible substrate in the present claimed invention is not required to be optically  
22 transparent, as the light emitted by the light sources does not pass through the flexible substrate, and  
23 is not directed away from the flexible substrate by any light extracting deformities.

24 Claim 1 has further been amended to recite that the array of light sources on the flexible  
25 substrate extend orthogonally in two directions. While Parker illustrates a two-dimensional array of  
26 light sources (array 31 in FIGURES 3 and 4), Parker clearly teaches that the light sources of array 31

1 are not mounted on or attached to the flexible substrate at all, but instead are "strategically mounted"  
2 behind the flexible substrate, so that light emitted from array 31 passes through the flexible substrate.  
3 Parker describes the array as follows.

4       An additional array of light sources 31 such as LEDs or incandescent or  
5 halogen lamps (with or without reflectors) may also be strategically mounted  
6 inwardly (i.e., behind) the inner surface of the light emitting panel members 29  
7 and/or 30 to cause a more intense light to shine through the panel members and a  
8 trans reflector 32 if provided on the panel members or through one or more clear  
9 areas or holes 33 through the panel members where no print pattern, back reflector  
10 or trans reflector is provided on the panel members as also schematically shown in  
11 FIGS. 3 and 4 for specific applications, for example, to provide brake or turn  
signal lights, turning or backup illumination, etc. By locating the light sources 9  
for illuminating the panel members 29 themselves adjacent one or more ends of  
the panel members, they will not interfere with or obstruct the visibility of the  
array of light sources 31 shining through the panel members (column 9,  
lines 7-29).

12       The configuration described by Parker is therefore entirely different and contrary to  
13 applicants' claim recitation of light sources comprising an array "emitting light outwardly and away  
14 from said flexible substrate." Clearly, Claim 1 as amended is distinguishable over Parker. It should  
15 also be noted that none of the art cited by the Examiner suggests modifying the lighting system  
16 disclosed by Parker to achieve what applicants have claimed. Fundamental to Parker's design is that  
17 light emitted by light sources is directed *into* the flexible substrate, which is optically transparent,  
18 rather than being emitted from light sources mounted on the flexible substrate and directed outwardly  
19 and away from the flexible substrate. Thus, modifying Parker to achieve what applicants have  
20 claimed would require a fundamental change to the functional and structural characteristics of  
21 Parker's device, and no support for such a substantial modification is to be found in the cited art.  
22 Finally, while the above discussion has been limited to Claim 1, claims depending on Claim 1 are  
23 patentable for at least the same reasons as Claim 1. Accordingly, the rejection of Claims 1, 2, 4, 8,  
24 and 12 under 35 U.S.C. § 102(b) as being anticipated by Parker should be withdrawn.

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1 Claims Rejected Under 35 U.S.C. § 103(a)

2 The Examiner has rejected Claims 3, 5, 7, 10, 11, and 13-24 under 35 U.S.C. § 103(a) as  
3 being unpatentable over Parker in combination with various other references. The Examiner admits  
4 that Parker does not teach every element recited in applicants' claims, and the Examiner relies on  
5 various combinations of art to conclude that applicants' claims are obvious in view of the cited art.  
6 Applicants respectfully disagree for the following reasons.

7 Because dependent claims are patentable for at least the same reasons as the claims from  
8 which they depend, applicants will limit the present response to addressing how independent  
9 Claims 1, 13, and 23 distinguish over the cited art. Note that Claims 3, 5, 7, 10 and 11 are all  
10 ultimately dependent on independent Claim 1, Claims 14-22 are all ultimately dependent on  
11 independent Claim 13, and Claim 24 is dependent on independent Claim 23. However, while  
12 applicants may not address other specific differences between the art cited and each of the dependent  
13 claims, applicants do not intend to suggest that these differences do not exist.

14 With respect to the rejections of Claims 3, 5, 7, 10, and 11, the Examiner asserts that Parker in  
15 combination with Duarte (Claim 3), Gustafson (Claims 5, 7) and Parkyn (Claims 10 and 11) disclose  
16 all of the elements of applicants' claimed invention, and that sufficient motivation exists to make the  
17 suggested combinations of references.

18 Duarte discloses self-adhesive strips that include a linear array of light sources (i.e., a row or  
19 column), not the recited orthogonal array of applicants. Duarte discloses light sources that emit light  
20 outwardly and away from a substrate; however, there is no suggestion in the cited art to modify  
21 Parker to include light sources that emit light outwardly and away from a substrate, and such a  
22 modification would *dramatically* change the device disclosed by Parker, nor is there a suggestion to  
23 modify the linear adhesive strips of Duarte to be useful as exterior lighting for vehicles. Specifically,  
24 Duarte's light strips would not be suitable for exterior applications such as turn signal and brake  
25 lights, as such applications generally require more light than can be provided by the linear array of  
26 lights or strips disclosed by Duarte. Finally, there is no suggestion to modify either Parker or Duarte

1 to achieve the recited orthogonal array. While the Examiner asserts that it would be obvious to  
2 modify the device of Parker to include an adhesive layer as disclosed by Duarte, to achieve an  
3 inexpensive mounting means, that motivation is insufficient to modify the art to achieve the invention  
4 recited in amended Claim 1. Applicants have already shown that Parker fails to disclose an array of  
5 light sources mounted on a flexible substrate, and the combination of references proposed by the  
6 Examiner would fail to achieve the configuration recited by applicants in their claims.

7 With respect to the rejections of Claims 5 and 7 over Parker in view of Gustafson, it is not clear  
8 what elements from Gustafson the Examiner is relying upon, since the discussion of the rejection of those  
9 claims appears to only reference Parker. In any event, Gustafson discloses a light strip having light  
10 sources that emit light outwardly and away from a substrate. However, as noted above, there is no  
11 suggestion or justification in the cited art to modify Parker to include light sources that emit light  
12 outwardly and away from a substrate, and such a modification would require a substantial change in the  
13 configuration that is fundamental to Parker's disclosed invention. Also, there is no suggestion to modify  
14 the linear light strips of Gustafson to achieve the recited orthogonal array. While the Examiner asserts  
15 that it would be obvious to modify the device of Parker to include certain electrical connections disclosed  
16 in Gustafson, that motivation is insufficient to explain how one of ordinary skill in the art would be led to  
17 modify Parker to achieve the invention recited in amended Claim 1.

18 The Examiner has rejected Claims 10 and 11, also depending on amended Claim 1, as obvious  
19 over Parker in view of Parkyn. Claims 10 and 11 recite totally internally reflective (TIR) lenses.  
20 Parkyn discloses a lens, which includes at least one TIR and is very efficient in forming a beam.  
21 Even if combined with the other references as proposed by the Examiner, the combination of Parker  
22 and Parkyn would result in a device in which each light transition region 10 of Parker would include  
23 a TIR lens as disclosed by Parkyn. The light from a light source, while enhanced by such a TIR lens,  
24 would still be directed inwardly *into the flexible substrate*, and not outwardly and away from the  
25 substrate as recited in amended Claim 1.

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1 Applicants again respectfully note that the combination of art employed to reject Claim 9 is not  
2 readily apparent from the Office Action. However, as discussed above, no combination of Parker,  
3 Parkyn, Gustafson, and Duarte achieves applicants' invention as recited in amended Claim 1. Because  
4 dependent claims are patentable for at least the same reasons as the claims from which they depend,  
5 Claims 3, 5, 7, 9, 10, and 11 are patentable for the same reasons as Claim 1. Accordingly, the rejections  
6 of Claims 3, 5, 7, 9, 10, and 11 under 35 U.S.C. § 103(a) as being unpatentable over Parker, in  
7 combination with any of the above-noted references, should be withdrawn.

8 Turning now to the rejections of independent Claim 13 and dependent Claims 14-22, applicants  
9 note that independent Claim 13 has been amended to recite that light emitted from the plurality of light  
10 sources is directed *outwardly and away* from the flexible substrate. With respect to Claim 13, the  
11 Examiner admits that Parker does not disclose the recited positive flexible conductive trace and negative  
12 flexible conductive trace, and relies on Gustafson for disclosing the flexible positive and negative  
13 conductive traces. The Examiner asserts that it would have been obvious to modify Parker to enable the  
14 light sources to be coupled to a power supply.

15 However, to achieve applicants' invention as recited in amended Claim 13, Parker would need to be  
16 modified to include light sources directed outwardly and away from the flexible substrate. As discussed  
17 above, such a modification would significantly change the fundamental structural characteristics of Parker's  
18 invention, and there is no basis in the cited art for making such a modification or motivation that would lead  
19 one of ordinary skill to do so. Note that a central feature of Gustafson is fully encapsulating the light  
20 sources and substrate in a *structurally strong protective shell*, to provide protection from moisture and  
21 damage. Clearly, Gustafson teaches away from employing a flexible, light transmissive cover. Thus, there  
22 appears to be no justification for combining Parker and Gustafson in the manner required to achieve what  
23 applicants have claimed in Claim 13 (as amended). Because dependent claims are patentable for at least the  
24 same reasons as the claims from which they depend, Claims 14-17, 19, 20 and 22 are patentable for the  
25 same reasons as Claim 13. Accordingly, the rejections of Claims 13-17, 19, 20 and 22 under 35 U.S.C.  
26 § 103(a) as being unpatentable over Parker, in combination with Gustafson, should be withdrawn.

1 With respect to the rejection of Claims 18 and 21, the Examiner admits that the combination of  
2 Parker and Gustafson does not expressly disclose the incorporation of TIR lenses. The Examiner relies on  
3 Parkyn for disclosing the TIR lens. However, as stated above, the combination of Parker and Gustafson  
4 with Parkyn does not render Claim 13 (as amended) obvious, because use of Parkyn's TIR lens on the  
5 edge-mounted light sources of Parker that direct light into a flexible substrate is a substantially different  
6 device than that defined by this claim of applicants. Because dependent claims are patentable for at least the  
7 same reasons as the claims from which they depend, Claims 18 and 21 are patentable for the same reasons  
8 as Claim 13. Accordingly, the rejections of Claims 18 and 21 under 35 U.S.C. § 103(a) as unpatentable  
9 over Parker, in combination with Gustafson, and further in view of Parkyn, should be withdrawn.

10 Independent Claim 23 recites a method for providing external lighting to a vehicle. The Examiner  
11 asserts that Gustafson discloses the recited method except for attaching the flexible substrate to the  
12 external surface, so the substrate and cover conform to non-planar surfaces.

13 Applicants respectfully submit that Gustafson does not disclose protecting a plurality of light  
14 sources with a flexible, generally transmissive light cover. Applicants note that a stated goal of Gustafson  
15 is to provide a rugged and durable light strip, which is not as easily damaged as prior art devices whose  
16 light sources were enclosed in a generally *flexible* hollow tube, which offered little structural protection.  
17 Gustafson solved that problem by completely encapsulating the light sources and flexible substrate in an  
18 optically transparent material.

19 Note that with respect to the encapsulating material, Gustafson specifically discloses that the  
20 encapsulant must be "durable and capable of withstanding considerable loads" (column 4, lines 20 and 21).  
21 A material that is durable and capable of withstanding considerable loads is generally not considered to be a  
22 flexible material, unless the material is specifically selected for both structural strength *and* flexibility.  
23 There is no suggestion in Gustafson that the encapsulant is strong *and* flexible. Note that Gustafson  
24 specifically suggests the use of polychlorotrifluoroethylene (PCTFE). The following website provides  
25 mechanical property data for PCTFE ([http://www.boedeker.com/pctfe\\_p.htm](http://www.boedeker.com/pctfe_p.htm)). In particular, the Tensile  
26 Strength is (PSI) 5300, the Flexural Strength is (PSI) 8500, and the Flexural Modulus is (PSI) 180,000.

1 Mechanical properties for a *rigid* urethane polymer are available at the following website:  
2 [http://www.solidconcepts.com/rp/urethane\\_materials.htm](http://www.solidconcepts.com/rp/urethane_materials.htm). These properties include a Tensile Strength  
3 (PSI) of 5500, a Flexural Strength (PSI) of 5870, and a Flexural Modulus (PSI) of 174,000. Based on the  
4 similarities in properties between PCTFE and a *rigid* urethane, and Gustafson's express disclosure that the  
5 encapsulant *must* provide protection from considerable loads, it is reasonable to conclude that Gustafson  
6 teaches away from the use of a flexible protective cover.

7 Thus, the art described by the Examiner cannot logically be combined to achieve applicants'  
8 invention as claimed, because Gustafson discloses a strong encapsulant that is generally rigid, and  
9 therefore teaches away from the use of a flexible light transmissive cover. Modifying Parker to  
10 include the teaching of Gustafson would require ignoring the teaching of Gustafson against the use of  
11 a flexible cover, and thus, is an improper modification.

12 Applicants have amended Claim 23 to recite additional elements relating to the manner in  
13 which the light sources are applied to the flexible substrate. By doing so, Claim 23 is clearly  
14 distinguishable over Parker, because the Parker reference includes the light sources along an edge, as  
15 opposed to light sources on the surface flexible substrate opposite to the surface of the flexible  
16 substrate that is attached to the vehicle. As disclosed by Parker, the light sources are disposed along  
17 the edge of the flexible substrate or behind the flexible substrate. To achieve the invention recited in  
18 amended Claim 23, Parker would need to be modified so that the light no longer passes through the  
19 flexible substrate, which is such a major modification of the fundamental design of Parker's invention  
20 that it is not reasonably supportable. Because dependent claims are patentable for at least the same  
21 reasons as the claims from which they depend, Claim 24 is patentable for the same reasons as  
22 Claim 23. Accordingly, the rejections of Claims 23 and 24 under 35 U.S.C. § 103(a) as being  
23 unpatentable over Parker, in combination with Gustafson, should be withdrawn.

24 Claims Objected to by the Examiner

25 The Examiner has objected to Claim 6, noting that it would be allowed if rewritten to include  
26 all elements of the base claim and any intervening claims. Because the present amendment

1 distinguishes Claim 1 over the cited art, Claim 6 is patentable for at least the same reason as Claim 1,  
2 and applicants elect to not rewrite Claim 6 in independent form at this time.

3 Patentability of Newly Added Claim

4 Applicants have added new Claims 25 and 26, which are fully supported by applicants' disclosure  
5 and drawings as originally filed. Claim 25 positively recites a three layer device in which light sources  
6 are disposed on a front surface of a flexible substrate; the front surface has a substantially greater surface  
7 area than side or edge surfaces; and the light sources are disposed in an orthogonal array to emit light  
8 outwardly and away from the flexible substrate. Claim 26 positively recites a three-layer device in which  
9 that light sources are disposed on a front surface of a flexible substrate; the front surface has a  
10 substantially greater surface area than the edges; and the light sources are disposed in a densely-packed  
11 array to emit light outwardly and away from the flexible substrate, the densely-packed array having a size  
12 and shape similar to the flexible substrate. No combination of the cited art discloses an orthogonal array  
13 mounted on a front surface of a flexible substrate, or the recited densely packed array. Accordingly,  
14 Claims 25 and 26 recite patentable subject matter.

15 In consideration of the amendment to the claims and the preceding Remarks, it will be  
16 apparent that all claims in this application are patentable. The Examiner is therefore requested to  
17 pass this application to Issue without further delay. In the event that any issues remain unresolved,  
18 the Examiner is invited to telephone applicants' attorney at the number listed below.

19 Respectfully submitted,

20 *Ron Anderson*

21 Ronald M. Anderson  
22 Registration No. 28,829

23 I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed  
24 envelope as first class mail with postage thereon fully prepaid addressed to: Commissioner of Patents and  
Trademarks, Washington, D.C. 20231, on September 19, 2001.

25 Date: September 19, 2001  
26 RMA:MCK:klp

*Kathy P...*